CLAIMS

What is claimed is:

1.   A method of increasing transmission control protocol (TCP) re-transmission process speed, the method comprising the steps of:

generating a first duplicate TCP acknowledgement (Ack) covering a received TCP segment that is determined to be valid by TCP and was dropped by TCP based on an upper layer protocal (ULP) decision; and

transmitting the first duplicate TCP Ack.

2.   The method of claim 1, wherein the ULP includes at least one of: a marker with protocol data unit alignment (MPA) protocol, a direct data placement (DDP) protocol, and a remote direct memory access (RDMA) protocol.

3.   The method of claim 1, wherein the first duplicate TCP Ack is generated for a TCP segment regardless of whether the TCP segment is in-order or out-of-order.

4.   The method of claim 1, wherein the first duplicate TCP Ack is generated even where a next in-order TCP segment has not been received.

5.   The method of claim 1, further comprising the step of generating a second duplicate TCP acknowledgement (Ack) covering a next out-of-order received TCP segment.

6.   The method of claim 5, further comprising the step of transmitting the second duplicate

TCP Ack.

7.   A system for increasing transmission control protocol (TCP) re-transmission process

speed, the system comprising:

a TCP acknowledgement (Ack) generator to generate a first duplicate TCP Ack covering

a received TCP segment that is determined to be valid by TCP and was dropped by TCP based on

an upper layer protocal (ULP) decision.

8.   The system of claim 7, further comprising means for transmitting the first duplicate TCP

Ack.

9.   The system of claim 7, wherein the ULP includes at least one of: a marker with protocol

data unit alignment (MPA) protocol, a direct data placement (DDP) protocol, and a remote direct

memory access (RDMA) protocol.

10.   The system of claim 7, wherein the generator generates the first duplicate TCP Ack for a

TCP segment regardless of whether the TCP segment is in-order or out-of-order.

11.   The system of claim 7, wherein the generator generates the first duplicate TCP Ack even

where a next in-order TCP segment has not been received.

12.   The system of claim 7, further comprising a TCP Ack generator for generating a second

duplicate TCP acknowledgement (Ack) covering a next out-of-order received TCP segment.

13.   The system of claim 12, further comprising means for transmitting the second duplicate

TCP Ack.

14.   A computer program product comprising a computer useable medium having computer readable program code embodied therein for increasing transmission control protocol (TCP) re-transmission process speed, the program product comprising:

program code configured to generate a first duplicate TCP acknowledgement (Ack) covering a received TCP segment that is determined to be valid by TCP and was dropped by TCP based on an upper layer protocal (ULP) decision.

15.   The program product of claim 14, further comprising program code configured to transmit the first duplicate TCP Ack.

16.   The program product of claim 14, wherein the ULP includes at least one of: a marker with protocol data unit alignment (MPA) protocol, a direct data placement (DDP) protocol, and a remote direct memory access (RDMA) protocol.

17.   The program product of claim 14, wherein the generating program code generates the first duplicate TCP Ack for a TCP segment regardless of whether the TCP segment is in-order or out-of-order.

18.   The program product of claim 14, wherein the generating program code generates the first duplicate TCP Ack even where a next in-order TCP segment has not been received.

19.   The program product of claim 14, further comprising program code configured to generate a second duplicate TCP acknowledgement (Ack) covering a next out-of-order received TCP segment.

20.   The program product of claim 19, further comprising program code configured to transmit the second duplicate TCP Ack.